THE AMERICAN
JOURNAL OF PHARMACY.

OCTOBER, 1878.

ADDITIONAL NOTES ON CHAMÆLIRIN AND ITS DECOMPOSITION PRODUCT, CHAMÆLIRETIN.

By Francis V. Greene, M.D., U.S N.

Immediately after the publication in this journal (May, 1878, p. 250) of the paper on Chamælirin, a series of experiments were made to ascertain its physiological action, during the course of which it became strikingly apparent that in several particulars its toxic effects were precisely similar to those produced by saponin. The employment of absolute alcohol as the means of extracting the bitter substance from the magnesia mass, proved conclusively that it could not be saponin, as all authorities, with the exception of Bley, who states that it is soluble in 400 parts of absolute alcohol, agree in regard to the insolubility of this glucoside in absolute alcohol. As, however, there remained the possibility that, in case the chamælirium root contained saponin, the alcohol used in the extraction might have dissolved a sufficient quantity to account for the chemical reactions and the poisonous effects of the chamælirin, it seemed advisable to ascertain the precise action of the absolute alcohol employed on saponin itself. Accordingly, some saponin, prepared by Gehe & Co., of Dresden, after being well dried, was heated with a portion of the same kind of absolute alcohol (Squibb's) that had been used throughout the experiments, the mixture set aside, and, after the saponin had settled, a portion of the liquid filtered off and evaporated to dryness in a capsule. Distilled water was then placed in the dish, and after heating for some time it was allowed to cool, and a portion was transferred to a test-tube. On agitating the liquid no frothing was produced. This experiment proves that even had the thoroughly dried magnesia mass contained saponin, this glucoside would not have been removed by this alcohol, and consequently the entire freedom of the chamælirin from saponin may be considered as conclusively established.

As it was necessary in injecting the chamælirin hypodermically, and also into the blood vessels, to have the aqueous solution in a concentrated form, ten grains of chamælirin were placed in a beaker, and one hundred minims of distilled water added. By gentle agitation the substance gradually dissolved, giving a clear, syrupy solution, of a yellowish-brown color. Solutions of this strength were, however, found to become cloudy on standing, and to deposit a small amount of gelatinous matter in the course of a few days; it was likewise noticed that by diluting them with water while clear that a turbidity was produced, which disappeared on heating the solution, reappearing on cooling, and subsiding very slowly.

With a view of getting rid of this insoluble matter, which was evidently an impurity, and likewise removing the coloring matter, if possible, a quantity of chamælirin containing the insoluble matter was dissolved in water with agitation, and the cloudy solution set aside to settle. After the subsidence of the insoluble portion the liquid was filtered, and as a small quantity of the insoluble substance passed through the filter at the close of the operation, communicating a slight haziness to the solution, magnesia was added to it, and the mixture evaporated to dryness. The dried mass was then extracted with ether and afterwards with absolute alcohol, and the alcohol evaporated off on a water-bath. On adding distilled water to the resulting chamælirin it was found to form a perfectly clear solution, thus proving that the whole of the insoluble matter can be removed by subsidence and extraction with ether.

As the chamælirin thus obtained was still slightly colored, it was dissolved in distilled water, animal charcoal added, the mixture violently agitated, evaporated to complete dryness on a water-bath, and then extracted with boiling absolute alcohol. On evaporating the alcohol the chamælirin was found to be almost perfectly white, and to yield concentrated solutions of a very pale yellow color.

When a minute quantity of this purified chamælirin is brought in contact with a few drops of concentrated sulphuric acid, on a porcelain plate, there is produced a bright orange color, turning rapidly into a crimson, which changes to a brown color, and then to a rich green, lasting for some time, but finally passing into a purple, which gradually fades away, leaving a dark green insoluble mass in the centre of a colorless liquid. The reaction with hydrochloric acid is the same

characteristic peach-red color mentioned in the former article. The color resulting from the action of this acid can be best observed by adding the acid to a small quantity of the substance contained in a test-tube. The precipitates formed by adding baryta water and solution of subacetate of lead to solutions of chamælirin are soluble both in water and an excess of the precipitant.

In order to determine the characters of the decomposition products of chamælirin, some of the substance was digested, at a moderate heat, with a 2 per cent. solution of hydrochloric acid, when it was found that the solution became cloudy after awhile. On adding water, and allowing the liquid to cool, the precipitate which had formed quickly subsided. A portion of the supernatant liquid was, after neutralization, tested with Fehling's solution, and gave decided evidence of the presence of glucose. The precipitate was then transferred to a filter and thoroughly washed with distilled water, when, after drying as far as possible by pressing the filter between folds of bibulous paper, it was transferred to a capsule and dissolved in absolute alcohol. On the evaporation of the alcohol, on a water-bath, the residue, for which I propose the term *chimæliretin*, was found to be a dull white, somewhat resinous substance, without taste or odor, and readily reducible to a powder. It is insoluble in water. It dissolves more readily in cold absolute alcohol than chamælirin, and remains in solution on adding about an equal volume of water, but is precipitated if the alcohol is further diluted. It is very soluble in ether. With concentrated sulphuric acid it gives a brown color, which changes after some time to an undecided purplish hue; no characteristic reactions are afforded by either nitric or hydrochloric acids.

For the purpose of solving, if possible, the problem in regard to the real character of the insoluble matter contaminating the chamælirin, a few ounces of chamælirium root were exhausted with ether, and the solution evaporated until all the ether was expelled. On adding water to the residue, and heating on the water-bath, the liquid became cloudy, and oil globules collected on the top. The liquid was then allowed to cool, when the floating mass assumed a semi-liquid appearance. After treating this oily mass with several portions of water, it was found to possess a disagreeable odor, and to give an acid reaction with litmus paper. Compounds were formed by it with baryta water, solution of sub-acetate of lead, lime water, ammonia and caustic soda solution.

It is therefore a fatty acid, and is undoubtedly the substance which, either in its free state or in some combined form, dissolves in the concentrated solutions of chamælirin.

In addition to the chamælirin and the fatty acid just referred to, a free acid, glucose, starch and tannic acid, giving a greenish precipitate with per-salts of iron, have been incidentally recognized as present in the root of the Chamælirium luteum.

The physiological experiments that I have made with chamælirin prove that it is a cardiac poison, and that it produces its toxic effects by virtue of a depressing influence on the pneumogastric centres, and likewise by more or less completely exhausting or paralyzing the heart muscle. It also possesses, in common with saponin, the remarkable property of immediately dissolving the red corpuscles, when a small quantity, either in powder or aqueous solution, is added to the blood.

In November, 1876, Prof. Husemann published in the "Archiv der Pharmacie" a very valuable paper on the "Distribution of the Cardiac Poisons in the Vegetable Kingdom," wherein he pointed out that the number of families of plants containing well-established principles affecting the action of the heart was very small, and that these principles had invariably been proved to be glucosides. In the course of his communication he calls attention to various American plants belonging to the families furnishing cardiac poisons, in which he thinks there are strong grounds for suspecting the existence of principles having a toxic effect upon the heart. The discovery, therefore, of a glucoside having the properties of a cardiac poison in an indigenous plant belonging to one of these families, the Liliaceæ, tends strongly to confirm the opinions expressed by him on this subject.

CIMICIFUGA RACEMOSA, Ell.

By Frank H. Trimble, Ph G.

Abstract from an Inaugural Essay.

The concentrated tincture of black snake root was precipitated by water and the resin collected and put aside. The aqueous filtrate was precipitated by basic acetate of lead, the precipitate suspended in alcohol, decomposed by sulphuretted hydrogen, and the alcoholic filtrate evaporated. The residue was amorphous, could not be obtained in crystals, and gave with ferric chloride a dark-green color, similar to that produced

by quercitrin, but appears not to be a glucoside, since after boiling with muriatic acid Trommer's test failed to indicate the presence of sugar. The aqueous filtrate from the resin yielded with gelatin a white precipitate, which, however, after having been washed with water, was not colored black or dark-green by ferric chloride, proving the absence of tannin.

The resin of cimicifuga was freed from fatty matter by petroleum benzin and afterwards exhausted with chloroform, which dissolved an uncrystallizable resin, soluble in alcohol and ether, but insoluble in oil of turpentine and bisulphide of carbon. Its alcoholic solution, which has an acid reaction, was precipitated by subacetate of lead, the filtrate freed from lead by sulphuretted hydrogen, and evaporated spontaneously. It was expected to yield the crystalline principle described by T. E. Conard ("Am. Jour. Phar.," 1871, p. 152); but crystals could not be obtained, though the yellow resinous mass had the behavior described by him.

The lead precipitate with the chloroformic resin was decomposed by sulphuretted hydrogen; the filtrate had a decided acid reaction, was freed from some matter yielding with ammonia a brown precipitate by precipitating with water and redissolving in alcohol; after concentrating and evaporating spontaneously over sulphuric acid, greenish prisms were obtained, which were deliquescent on exposure, had an acid taste, were soluble in ether, alcohol and water, yielded with ferric chloride a white precipitate, and when heated on platinum foil fused, burned, and finally left some red-brown residue.

The fatty matter left on evaporating the benzin solution yielded to alcohol a yellow acid matter, which was partially soluble in water, soluble in ether and chloroform; gave with ferric chloride a yellow solution, had an agreeable odor, resembling that of pineapple, and was completely dissipated by heat. The fat was a soft solid at 60°F., but liquid at 100°F., was entirely free from inorganic matter, and on saponification yielded glycerin.

On treating the resin left by benzin and chloroform with alcohol, subacetate of lead, alumina, etc., as described by Mr. Conard, a little resinous mass was obtained having a behavior very similar to that of his crystalline principle.

No indications of a volatile oil or of an alkaloid were obtained. The principle which is colored green by ferric chloride entered to some extent into the various solutions made with simple solvents, but was wholly precipitated by basic acetate of lead.

HYDRASTIS CANADENSIS.

By Hermann Lerchen, Ph.G.

Abstract from an Inaugural Essay.

A cold infusion of the rhizome of hydrastis was found to contain *albumen*, *sugar*, *extractive matter* and an acid which produced a dingy-greenish precipitate with ferric chloride, but no precipitate was obtained with gelatin or sulphate of quinia, which seems to prove the absence of tannin. Boiling ether extracted from the powdered rhizome a *fatty resinous* mass, which was slightly colored, insoluble in water and nearly tasteless. Alcohol dissolved, besides the alkaloids, a brown *resin* of a soap like and bitter taste, leaving an acrid impression. On distilling the rhizome with water, the distillate contained a minute quantity of *volatile oil*, having the heavy odor of the infusion; the decoction left in the still gave, with iodine, abundant evidence of the presence of *starch*. On incinerating the powder, ten per cent. of *ash* was obtained, containing silica and carbonates, sulphates and chlorides, the bases being potassium, sodium, magnesium, calcium and iron.

The alkaloids were prepared from the cold watery infusion of hydrastis. On acidulating it strongly with hydrochloric acid, a yellow precipitate of hydrochlorate of *berberina* was deposited, which crystallized from alcohol in bright-yellow needles, insoluble in ether and chloroform, but soluble in water and alcohol. Strong sulphuric acid dissolves them with an olive-green color. Nitric acid changes the color to deep red, and ammonia to yellowish-brown. On adding to the solution in hot alcohol a dilute solution of iodine in potassium iodide, avoiding an excess of iodine, green spangles are produced (Perrins' test). This iodo muriate of berberina is sparingly soluble in cold water, but soluble in hot water and hot alcohol.

The mother liquor from the first berberina precipitate was treated as recommended by J. C. Burt ("Am. Jour. Phar.," 1875, p. 481); ammonia was added to it, with the precaution of keeping the liquid of a neutral reaction, and a yellow precipitate obtained which was crystallized from alcohol and then treated with dilute muriatic acid. Hydrochlorate of berberina was left behind, and the liquid now yielded a white precipitate of *hydrastia* with ammonia, which was left from the alcoholic solution in colorless rhombohedral crystals. These are insoluble in cold water, slightly soluble in cold alcohol and ether, soluble in

chloroform and hot alcohol. The alkaloid has an alkaline reaction on litmus paper, is soluble in strong muriatic acid, not colored by nitric acid, and when heated with strong sulphuric acid a light purple color is produced.

On adding to the neutral mother liquor of hydrastia an excess of ammonia, a dark-yellow precipitate was obtained, which crystallized from alcohol, the crystals being orange-yellow. This alkaloid dissolved in strong hydrochloric and nitric acid without change of color, and in sulphuric acid with a light-yellow. It is insoluble in cold and hot ether and in chloroform, but dissolves in hot water and alcohol, and has an acrid bitter taste. Tested with solution of iodine, in the same manner as berberina, light brown-colored spangles were obtained, entirely different from those of the berberina test. This alkaloid was first noticed by A. K. Hale (1873), and further described by J. C. Burt (1875). As yet it has not been named, and it is proposed to call it *Xanthopuccina*, from its yellow color and one of the common names of hydrastis, yellow puccoon.

PROCTER'S "VINUM DIGESTIVUM."

Nobody will ever question the right of a dealer or manufacturer to bring his goods to the notice of the public by way of advertisement, but when a manufacturer uses his advertisement to extol his preparation at the expense of another manufacturer, and thereby attempts to damage the latter one, such conduct, I think, is unfair, to say the least; particularly so, when by his statements he tries to mislead the judgment of others.

Wm. Procter, Jr., Co. say in their advertisement of Vinum digestivum that 1 fluidounce, mixed with 20 drops of hydrochloric acid and 4 ounces of water, dissolve out of 600 grains of coagulated albumen at least 500, and deduct therefrom that the Vinum digestivum is six times stronger than Scheffer's liquid pepsin.

Wm. Procter, Jr., Co. have commenced manufacturing pepsin almost immediately after I had published my process, and therefore I think it impossible that they should be ignorant of the fact that one and the same quantity of pepsin digests different quantities of albumen, according to the smaller or larger quantity of acidulated water in which the pepsin is dissolved.

When 1 fluidounce of Scheffer's liquid pepsin is mixed with 4

ounces of acidulated water, it will dissolve three or four times as much albumen as is claimed for it.

Ten grains of Scheffer's saccharated pepsin, for which I claim, when dissolved in 1 ounce of acidulated water, the strength of digesting, as minimum, 150 grains of coagulated albumen, will, when dissolved in 5 fluidounces of acidulated water, easily digest 500 out of 600 grains of albumen.

When, therefore, the allusion to Scheffer's liquid pepsin in the advertisement of Wm. Procter, Jr., Co. is not made by ignorance, it is made in a very unfair spirit, which stamps it to a dishonorable act.

E. SCHEFFER.

Louisville, September, 1878.

VINUM DIGESTIVUM.

In our advertisement of this preparation in the September number of this journal there occurs a sentence which, to our great regret, has been construed by Professor Scheffer in a manner totally different from the meaning intended to be conveyed by it. That, when testing pepsin, an increased quantity of acidulated water would determine the solution of larger quantities of albumen was well known to us, as was also the fact of the retardation of the process in the presence of alcohol. The addition of a larger proportion of water was justified by the presence of the vinous ingredient; so our test for Vinum digestivum was based on this, together with the desire to imitate the natural function of digestion in the amount of dilution, acidity, etc., employed.

The term "Liquid Pepsin of Scheffer" was used only in a generic sense, as applying to that preparation as made by ourselves and by hundreds of apothecaries, and not alone to the article as furnished from the laboratory of the originator.

Our reference to this was wholly without intention to detract from the merits of his article; for, while we departed from the standard established for liquid pepsin, we used its value as a measure of the comparative strength of our preparation, and in this sense only was the reference made.

The extraordinary solvent power of Vinum digestivum was quite as great a surprise to us when ascertained as it possibly could be to others —the difference in manipulation was the only clue to the great improve-

ment over our previous efforts to make an efficient wine of pepsin. Whether protracted contact with alcohol will affect its properties remains to be tested, as our own experience has as yet extended over three or four months only. With due deference to the liberal spirit in which Professor Scheffer gave the world the result of his researches in the field of artificial digestion, we here reiterate our disclaimer of the slightest intention of unfairness when we referred to his standard preparation. Of course, the elision of the offending sentence will be our first care. WM. PROCTER, JR., CO.

Philadelphia, September, 1878.

GLEANINGS FROM THE GERMAN JOURNALS.

BY LOUIS VON COTZHAUSEN, PH.G.

The Boiling Point of Sulphuric Acids of Different Concentration.—G. Lunge published the following table in the "Ber. d. Deutsch. Chem. Ges.," 1878:

Per cent. of H_2SO_4.	Boiling Point.	Per cent. of H_2SO_4.	Boiling Point.	Per cent. of H_2SO_4.	Boiling Point.
5	101 °C.	56	133 °C.	80	207 °C.
10	102	60	141·5	82	218
15	103·5	62·5	147	84	227
20	105	65	153·5	86	238·5
25	106·5	67·5	161	88	251·5
30	108	70	170	90	262·5
35	110	72	174·5	91	268
40	114	74	180·5	92	274·5
45	118·5	76	189	93	281·5
50	124	78	199	94	288·5
53	128·5			95	295

—*Pharm. Centralh.*, June 20, 1878, p. 226.

Fleischer's densimeters greatly resemble ordinary aræometers in appearance and construction, but differ in having their degrees indicated by the same number which expresses the decimal portion of the specific gravity. Thus 18° of the densimeter = 1·18 specific gravity, 50° = 1·50, spec. grav., 27½° = 1·275 spec. grav., 21¼° = 1·2125 spec. grav., etc. The normal temperature for the division is 15°C. The densimeter for pharmaceutical purposes is supplied with a thermometer.—*Ibid.*, p. 228.

Solubility of Silver Nitrate.—The following tables give the result of J. M. Eder's investigations:

100 *parts by weight of Alcohol dissolve:*

Temperature.	Spec. grav. of alcohol	0·815	0·863	0·899	0·912	0·933	0·951	0·964	0·975	0·986
	Volumetric per cent.	95	80	70	60	50	40	30	20	10
At 15°C.	Parts, by	3·8	10·3	22·1	30·5	35·8	56·4	73·7	107	158
At 50	weight, of	7·3			58·1		98·3		214	
At 75	nit. of silv.	18·3	42		89		160		340	

100 *cc. of Alcoholic Solutions, of Different Specific Gravity, contain:*

Per cent. of alcohol:		95.	80.	70.	60.	50.	40.	30.	20.	10
Grams of nitrate of silver at	15°C.=	3·	8·6	21·	27·1	33·4	52·8	60·6	89·1	130
	75 =12·5		33·6		51·		108·			

On cooling, the nitrate crystallizes in handsome thin tablets. It is sparingly soluble in pure ether, but 100 parts of water saturated with ether dissolve 88·4 parts by weight of the nitrate at 15°C.

The presence of sulphates of alkalies slightly increases the solubility of sulphate of silver in water.—*Schw. Wochenschr.*, June 7, p. 202, from *Journ. f. Pract. Chem.*

A quantitative analysis of genuine Karlsbad Sprudel Salt proved it to consist of 98 per cent. of sulphate of sodium and 2 per cent. of sulphate of potassium, thus differing from the constituents of the artificial salt, which are sulphate of sodium, chloride of sodium and carbonate of sodium. Dr. Uloth, after calling attention to the absence of sulphate of potassium in some lots of the genuine salt, suggests and recommends the following formula for imitating it:

Dry sulphate of sodium,	45 parts
bicarbonate of sodium,	33
chloride of sodium,	20
sulphate of potassium,	2

Four grams of the resulting salt dissolved in ½ liter of warm water corresponds in strength to Karlsbad water.—*Pharm. Ztg.*, July 3, p. 460.

Tests for Glucose.—*Pellet's solution* consists of 68·7 grams crystallized sulphate of copper, 200·0 grams chloride of sodium, 100·0 anhydrous carbonate of sodium and 6·87 grams chloride of ammonium dissolved in hot water and diluted to 1 liter. 10 cc. of this liquid correspond to 0·05 gram of glucose.

Sacchsse's solution of mercury consists of 18·0 grams dry iodide of mer-

cury, 25·0 iodide of potassium, 80·0 grams caustic potassa and water enough to make 1 liter. 40 cc. of this solution are heated to the boiling point, and sufficient solution of glucose is added to cause a complete reduction of the mercury, and until a few drops of the liquid cease to be blackened on the addition of sulphhydrate of ammonium. 40 cc. of this solution correspond to 0·1342 gram of glucose.—*Pharm. Centralh.*, June 13, p. 217.

Balsamum antarthriticum Indicum (*Indian balsam*) is the juice of a probably leguminous tree indigenous to the tropics, and is obtained by making deep incisions into the stem. It is used by the natives as a lotion for the whole body, it preventing, in their opinion, the injurious effects of moisture and sudden changes in the temperature; it is also employed as an antirheumatic remedy. Dr. H. v. Hoelder used it extensively for severe muscular and chronic rheumatism and arthritis, both alone and in connection with salicylic acid, and is fully convinced of its superiority over other external remedies. It has a syrupy consistence, a peculiar, characteristic, unpleasant odor, a light brown color, and contains much mucilaginous matter.—*Pharm. Ztg.*, July 6, 1878, p. 469.

Sapucaja nuts, the seeds of different species of Lecythis (Lecythis ollaria, L. lanceolata, L. pisonis, etc.), N. O. Lecythideæ, *Rich.*, indigenous to Brazil, were recently exported to Sweden. Dr. R. F. Friestaedt describes them as nearly cylindrical, plum-shaped, longitudinally deeply grooved, otherwise smooth, and light brown in color. The embryo is soft and has a mild and pleasant odor. They contain much fatty oil.—*Pharm. Ztschr. f. Russl.*, June 1, 1878, p. 335.

GLEANINGS FROM THE FRENCH JOURNALS.

By the Editor.

Subnitrate of Bismuth.—With the object of preparing this salt of constant composition, without any notable complications and with little loss of material, A. Lalieu has devised the following process: 200 grams of bismuth are dissolved in the usual manner in the requisite quantity of nitric acid, the solution decanted from the insoluble matter and poured into about 8 liters of water, containing 500 grams of ammonia water. The bulky white precipitate is washed, transferred to a capsule and heated in a water-bath for fifteen or twenty

minutes with 50 or 60 grams of caustic soda dissolved in a little water, whereby dense yellow anhydrous oxide of bismuth is formed. This is well washed by decantation and afterwards mixed with continued agitation with sufficient nitric acid added in small quantities, equal to 48·5 grams of nitric anhydrid; should the mixture become too hard, a little water is added, sufficient to impart a pasty consistence, and again heated in the water-bath for a few minutes, when it becomes perfectly white and rather more liquid. It is then diluted with little water, collected upon a filter resting upon a linen support, washed with about twice its volume of water, expressed and dried. The yield is about 265 grams.—*L'Union phar.*, August, p. 229–231.

Alf. Riche has investigated the causes of the variable composition of subnitrate of bismuth, and experimented with bismuth, to which 1 and 2 per cent. of lead were added. By following the process of the French Codex, in evaporating the nitric acid solution to two-thirds and adding to 40 or 50 times its volume of water, the following results were obtained:

Distilled water: The precipitate contained 15·10 per cent. N_2O_5.

Common water of Paris: 13·78 to 12·42 N_2O_5 and traces of lead.

Common water with ammonia, leaving an acid reaction: 9·80 to 11·80 N_2O_5 and about $\frac{1}{2}$ per cent. of lead.

Common water with ammonia in slight excess: 0·60 to 2·09 N_2O_5 and 8 to 10 per cent. of lead. Carbonate of sodium used in place of ammonia gave similar results.

Well-water containing lime, chiefly sulphate: 7·79 to 11·68 N_2O_5 and ·775 per cent. precipitate with sulphuric acid, of which ·056 was lead, the remainder sulphate of calcium.

The precipitates with ammonia and sodium carbonate were obtained from the acid mother liquors, decanted from the precipitates with water.

The author regards the subnitrate with the maximum proportion of nitric acid as above as the most useful for medicinal purposes, and is opposed to increasing its quantity by the partial neutralization of the mother liquor; the bismuth remaining in the mother liquor may be recovered by precipitation with an alkali and utilized in various ways. Should the bismuth contain silver and lead, the former is removed by adding to the acid solution before concentration a few drops of hydrochloric acid, the latter in a similar way by a little sulphuric acid, at the

same time stirring well. Only distilled water, or such which is free from lime, should be employed for precipitating subnitrate of bismuth. —*Jour. de Pharm. et de Chim.*, August, p. 147–156.

Lead in Subnitrate of Bismuth.—Carnot has recently proposed to dissolve 10 grams of the subnitrate in hydrochloric acid, concentrate the solution to a syrupy consistence, add a little sulphuric acid and then alcohol, which will retain the chloride and sulphate of bismuth in solution, while the sulphate of lead is precipitated (see page 318). Chapuis and Linossier have found this method defective, and propose the following process: 3 grams of the salt are boiled with 4 cc. of a 10 per cent. solution of a caustic soda and sufficient (about 4 cc.) of a 10 per cent. solution of yellow chromate of pottasium to render the liquid yellow. The clear liquid is decanted and the residue again boiled with 1 cc. of soda solution, a few drops of chromate and 2 or 3 cc. of water. The liquid is filtered and the filtrate acidulated with acetic acid, when chromate of lead is precipitated. One-fiftieth per cent. of lead may thus be detected if the acidulated filtrate is permitted to cool.—*Ibid.*, p. 156–159.

Falsification of Lycopodium.—Stan. Martin has observed an adulteration of lycopodium with *dextrin*, which may be recognized by macerating a portion in water for one hour with occasional agitation, filtering the liquid and evaporating it to dryness, when the dextrin will be left as an inodorous yellowish mass. Pure lycopodium, when ignited in a crucible, leaves a pulverulent charcoal of a dull black color; if mixed with dextrin, inflammable gases are given off, burning with a blueish flame, and the charcoal will be glossy and porous.—*Bull. gén. de Thérap.*, May 15, p. 410.

Pomegranate Bark.—On exhausting powdered bark of pomegranate root with ether, Durand obtained a little chlorophyll. Alcohol now took up a little brown-yellow resin, besides some principles soluble in water which were not examined. The bark was now mixed with milk of lime, the mixture dried, exhausted with alcohol, the tincture evaporated, filtered, mixed with ammonia and then agitated with chloroform, on the evaporation of which a brown-yellow residue was left. This had an alkaline reaction; by combining with an acid, decomposing with ammonia and agitating with chloroform it was obtained in whitish crystals. The solution in acetic acid yields a white

precipitate with Mayer's solution, and a brown-yellow one with compound solution of iodine. The author proposes to name the alkaloid *granatina*; its hydrochlorate was obtained in crystals.—*Jour. de Pharm. et de Chim.*, August, p. 168.

Scammony.—C. Govaerts has obtained from three different samples of scammony, as found in French commerce:

Resin,	85	20	8
Gum,	4	10	3
Starch,	—	63	75
Mineral matter, etc.,	11	7	14

The author favors the abandonment of scamony as an officinal drug, and its substitution by the resin prepared from scammony root.—*Rép. de Pharm.*, August, from *Jour. de Pharm. d'Anvers.*

Batiator root, a substitute for ipecacuanha, is described by Stan. Martin as being 2 or 3 decimeters long, thin, cylindrical, slightly flexuose, longitudinally striate or wrinkled, often with circular divisions, forming more or less elongated annulations, the fissures penetrating to the central thread like wood fibre. It is yellowish or grayish-brown, internally yellowish, breaks with a smooth fracture, is inodorous, has a slight acrid taste, and on mastication leaves in the mouth a nauseous impression, similar to that from ipecacuanha. The roots are in fascicles from a knotty uneven rootstock which is covered with short and appressed gray-brown silky hairs. The plant is found on the Senegal, and is now being propagated in Paris from the seeds. The root has properties very similar to those of ipecacuanha, and is given in similar doses.—*Bull. gén. de Thér.*, July 30, p. 74.

Syrup of ipecacuanha is proposed by Mr. Martin to be made from an alcoholic extract of the root, dissolved in water, filtered and again evaporated to an extract containing 15 per cent. of moisture. 1·50 gram of this extract is dissolved in enough warm simple syrup to obtain 1,000 grams. The author regards this process as yielding a syrup more uniform in medicinal properties than if prepared from the root.—*L'Union phar.*, June, p. 165.

Syrup of Liquorice.—Stan. Martin proposes two formulas, one made with the commercial extract, the other with the root; similar preparations are known in France as *sirop de Calabre* and *sirop de pauvre gens.* 1. 50 grams of powdered liquorice are left in contact with 150 grams of cold distilled water, and when dissolved, filtered; the

filtrate is mixed with 20 grams tartaric acid, 30 grams of tincture of fresh lemon-peel and 850 grams of simple syrup of 40° Baumé. 2. 500 grams of liquorice root, coarsely powdered, without the corky layer, are displaced with 1,500 grams of cold distilled water. The percolate is made into a syrup by using for every 100 grams of liquid 190 grams of sugar, and adding to the whole 30 grams of tincture of fresh lemon-peel and 20 grams of tartaric acid.—*Bull. gén. de Thér.*, August 30, p. 158.

Fraudulent Syrup of Almond.—Rabourdin, of Orleans, has met with an artificial orgeat syrup, which appears to have been made from a resinous tincture, probably made with tolu and benzoin, and flavored with oil of bitter almond, by mixing it with simple syrup in the proportion of 25 or 30 grams to the liter.—*L'Union phar.*, August, p. 232.

STRASSBURG TURPENTINE, its Origin and Character.

An abstract of a paper by E. G. in "Le Monde Pharmaceutique," de Mai 5, 1878.

The author lives in a valley of the Vosges, and is, therefore, able to procure on the spot specimens of the article of guaranteed purity and known origin. He names it Térébenthine des Vosges; Térébenthine vrai dite citriodore; Bigeon, Hanbury and Flückiger name it also Térébenthine d'Alsace, ou de Strasbourg, ou du sapin, ou au citron; in English, Strassburg Turpentine; German, Strassburger Terpenthin. It is the product of the Sapin (French), *Abies pectinata* D. C., *Pinus Abies* Du Roy (not L.), *P. Picea*, L. In the valleys of the Vosges 25 per cent. of the trees are of this species. It flourishes best on the northern slopes of the mountains, at an altitude of 600 to 800 meters, and yields most turpentine when from 25 to 50 years old. It is then 8 to 15 meters high. After this age the quantity decreases, and at 60 years become inappreciable.

A few years since 10 to 15 mountaineers annually appeared in the valley and established themselves at a farm house, which became the centre of their forest explorations. Latterly but two or three have come to gather a quintal or two of turpentine. This is contained in little bladders in the bark, from the size of a pin's head to that of a bean, the larger ones elongated in the direction of the axis. A vessel of tinplate, shaped like a sharply-pointed horn, is used to pierce the

bladders, and a tin can hanging at the side receives the day's gathering. The harvest is tedious, laborious and even dangerous, for the large trunks must be climbed to reach the bladders in the higher parts of the tree. No incisions are ever made. The crude product is roughly purified by standing it in the sun in the tin cans to allow heavy impurities to settle; it is then filtered through a bed of the branches and needles of the silver fir placed in a funnel of bark. When purified it sells at 4f. 80c. to 5f. 50c. a kilogram.

The fresh oleoresin is very fluid, flowing like syrup, color like amber, odor balsamic, sweet but not cloying, recalling that of lemons, and becoming more apparent in alcoholic solution; taste very acrid, slightly bitter. It is strongly acid, and dries easily, losing weight. It is soluble in its own weight of alcohol, the solution remaining clear after three months' rest. It is solidified in a few hours by $\frac{1}{16}$ of its weight of magnesia, and after 24 hours the mass becomes almost brittle. The last two characters are the most important, as Guibourt and Dorvault respectively announce their absence in Térébenthine de Strasbourg ou des Vosges.—*Chem. and Drug.*, June 15, 1878.

THE MESQUITE.

An industry that promises, perhaps, to be of considerable importance has recently sprung up in the West. The mesquite, a common tree of the deserts, and closely allied, botanically, to the acacia, yields, like the latter, a gum which closely resembles, and, in fact, is almost identical with, gum acacia (the gum arabic of commerce). This gum was brought to notice as long ago as 1854, by Dr. Shumard, of the United States Army. It has for some time been kept in the drug stores of the Mexican cities, and considerable quantities have been sent to San Francisco from the Mexican ports of the Pacific. During the past year it has become an article of export, some 12,000 lbs. having been gathered in Bexar county, Texas, and as much more between that and the coast.

The mesquite (or, as it is sometimes called, mosqueit) is the Mexican name for a leguminous tree belonging, like the gum arabic producing acacia, to the sub order *Mimoseæ*. It is a tree growing from 30 to 40 feet in height, with a rounded head. It bears, in its general aspect, a great resemblance to the common honey locust (*Gleditschia*); its leaves are twice-pinnate, and the leaflets narrow, somewhat curved, and

an inch or more in length; the flowers are small, greenish-yellow, and crowded in dense axillary spikes; the pod or bean is from 6 to 9 inches in length, curved or straight, flattened, and constricted between the seeds.

There are several species of mesquite, but the one under consideration (*Prosopis glandulosa* of botanists) has the widest range, being found as far north as the Canada river, and extending south into Mexico; it appears in Texas not far from the coast, and is the most abundant tree as far west as the Colorado and Gulf of California. Were it not for the presence of the mesquite immense tracts in Arizona and Northern Mexico would present greater difficulties to travelers than they do, since this tree affords the sole fuel and forage of the country. As fuel, the wood has no superior; it makes a fire almost as intense as one of anthracite. The pods or beans, which ripen in June, contain a sugary pulp, having an agreeable blending of sweetness and acidity, somewhat like the harvest apple. They are very nutritious, and while their importance to the civilized traveler lies in their value as food for horses in districts destitute of grass, they are of still greater importance as articles of food to the Indians living within its reach. To whites, the taste of the fruit is somewhat mawkish and unpleasant, but it is greatly relished by the Mexicans and Indians. The latter, when the pods are in a fresh, ripe state, put them into a wooden or stone mortar and bruise them, then mix them with water and empty them into an earthen dish, where, after standing a few hours, there results a sort of cold porridge or mush. All present then collect around the newly-prepared mess, and, sitting on the ground near the dish, scoop the food out with their hands without any ceremony, and without regard to distinction of rank, age or sex. The nearly naked bodies of the Indians soon become smeared with the food from head to foot, and the shaggy appearance of their hair adds nothing to their aspect of cleanliness. The meal finished, their faces assume a complaisant look, while their tumid abdomens give abundant evidence of the quantity of food consumed.

The pods, as they ripen, are gathered for winter use; and, after being thoroughly dried, are stowed in cylindrical-shaped baskets made of twigs, and covered with mud and grass to keep out rain. In this shape they can be preserved for a long time. They are among the great luxuries of the Apaches, Pimas, Yumas, Maricopas, Mohaves, Hualipais, Cocopahs and Moquis of Arizona, besides of many tribes

in New Mexico, Utah, Nevada and the southern portion of California. The squaws pound the dry pods until reduced to a fine powder, which, being mixed with a little water, is pressed into large thick cakes weighing several pounds, and these being dried in the sun are afterwards used as circumstances require. The pods are also often kept in the powdered state in bags; but if the beans are not pulverized as fine as the pulp they soon become a living mass, since from every bean will issue a weevil, a species of *bruchus*. To the Indians, however, this is a matter of indifference, and they never trouble themselves to pick the insect out, but allow them to become an ingredient of the bread. If reduced to a fine flour, the insect larva becomes a part, forming a homogeneous mass of animal and vegetable substance. The flour, being very sweet, forms, when mixed with water, an agreeable drink; boiled in water and fermented, there results a pleasant and nutritious beverage, held in great esteem by the natives. The bark of the tree is utilized by the Indian women for making skirts, and it is also twisted into ropes or twine, and even woven into baskets.

The gum which exudes spontaneously from the bark of the tree is described as very similar in its properties to gum arabic, and an analysis by Dr. Morfit has shown that in composition and chemical properties it very closely resembles the latter. As it oozes from the bark it concretes into tears and lumps of various sizes, which vary in color from pale-yellow to dark-amber. It is very brittle, easy to pulverize, and its fractured surfaces are brilliant.

The natural exudations from a single tree vary from an ounce to three pounds, but doubtless much more would be yielded were incisions made in the bark. The branches are said to furnish a purer quality than the trunk. The gum, when perforated by insects, is often eaten by the Indians. All the tribes of Arizona mix this exudation with mud, which is then daubed over the head, thus serving two purposes—killing parasites, and rendering the hair dark and glossy. As the mesquite trees abound upon the plains over regions thousands of miles in extent, and flourish luxuriantly in dry and elevated situations, the gum must, in course of time, become an important commercial article when the facilities for gathering it become more perfect.—*Scientific American*, Aug. 31, 1878.

A NEW TEST FOR GLYCERIN.

By A. Senier, M. D., and A. J. G. Lowe, Assistants in the Laboratories of the Pharmaceutical Society.

In a previous paper ("Pharm Jour.," viii, 819) we have shown that when certain acid borates, as, for example, ordinary sodium biborate, are dissolved by glycerin, the glycerin does not act simply as a solvent. We found that acid was evolved, which was probably free boracic acid, and that there remained behind more basic borates, having a constitution between mono- and bi-borates. Klein ("Compt. rend.," lxxxvi, 826) says that with acid borates mannite forms conjugated acids. He describes briefly some compounds obtained, and then says that similar reactions take place in the case of glycerin, erythrite and certain other polyatomic alcohols. It is true that mannite, erythrite, etc., evolve acid with sodium biborate in the same manner as glycerin, but the reactions are probably not the same. The test which we are about to describe is not given by mannite, glucose, etc., although it is readily obtained from glycerin, erythrite, and apparently from glycol. We are at present investigating this reaction more fully. It is interesting, however, to note here, that while we find the action of glycerin and erythrite to differ from the action of mannite and glucose, Klein also finds the action upon polarized light different in the case of the two former, from what it is in that of the latter. The well-known green color which free boracic acid imparts to flame is usually obtained in the case of borates by the use of a stronger acid, but Iles ("Chem. News," xxxv, 204) suggests that glycerin may advantageously be substituted for the acid. The glycerin test for boracic acid involves, of course, the reaction which we have just discussed.

It occurred to us that this reaction might also be employed as a test for glycerin, but before we describe the method of applying it to that end, it will be convenient to discuss briefly its limits as regards other bodies. As might be anticipated from what we have said, monoborates do not give this reaction, at least that is the case with sodium monoborate. A considerable quantity of alkali interferes with the test, doubtless by neutralizing and fixing the acid set free. Again, a large excess of borax itself prevents the appearance of the green color in the flame. This action of a large excess of borax is interesting. Now as to bodies which may be mistaken for glycerin. Acids give the same result to flame as glycerin, and hence the solution to be tested

must be neutral or faintly alkaline. Erythrite, and apparantly glycol, also give the same green flame, but could hardly occur so as to be mistaken for glycerin. The same may be said of copper salts and certain other substances, which of themselves might impart a green color to flame. Other substances, such as sugars, fats, etc., were tried, but all failed to give this test. It appears, then, in the absence of erythrite, and probably glycol, to be a property fairly characteristic of glycerin.

The test is applied as follows: The aqueous solution to be examined is first made slightly alkaline with dilute soda-solution, and a borax bead is dipped into it. The bead is allowed to rest for a minute or so to allow solution to take place on its surface. Then it is held in the Bunsen flame in the usual way. Another method, and this we find more delicate, is to place a little powdered borax on a watch glass, and pour on to it some of the solution made faintly alkaline. Stir with a glass rod (the mixture becomes acid of course), and by means of a looped platinum wire introduce some of the mixture into the flame. In either case the deep green color appears more or less distinctly if glycerin be present in sufficient quantity.

The following experiments were made with the view of determining the extent to which the test could be applied to the detection of glycerin in various solutions. The percentages are by volume:

Glycerin in Water.—The solutions were made faintly alkaline. A 20 per cent. solution gave the color very decidedly. Solutions containing 15, 10 and 5 percentages gave the color distinctly. $2\frac{1}{2}$ per cent. gave a faint color, and the limit seemed to be reached in the case of a 1 per cent. solution, which gave scarcely any color.

Glycerin in Beer.—The solutions were made faintly alkaline. 25 and 20 per cent. solutions gave the color decidedly. A 10 per cent. solution gave it distinctly, but in the case of a 5 per cent. solution it could scarcely be seen. It was evident from these experiments that, in order to detect less than 10 per cent. in beer, the solution of glycerin would have to be concentrated, and some of the foreign matter removed. To try this we prepared two solutions of glycerin, one containing 5 per cent. and the other 1 per cent. Both were treated in the same manner. 50 cc. were evaporated to dryness over a water-bath, and the residue was treated with 50 cc. of absolute alcohol. Solution of the glycerin in the alcohol was insured by well stirring the mixture and heating to boiling. The dish containing the mixture was then set

aside to cool and subside, after which the clear alcoholic solution containing the glycerin was decanted into another dish. The solution was evaporated to dryness as before, and again exhausted with absolute alcohol. The solution from this second treatment with alcohol was evaporated nearly to dryness, and a few drops of water added. The solution thus obtained was made faintly alkaline to delicate litmus paper with dilute soda solution, and tested in the manner already described. In each case the color was distinct, of course most decided in the case of the residue from the 5 per cent. solution. A solution containing onequarter of 1 per cent. was examined in the same way, and gave the color distinctly. Beer, to which was added only one-tenth of 1 per cent. of glycerin was examined by first concentrating and shaking with petroleum ether, to remove hop resin, and then evaporating to dryness and treating as above. In this case green color, though less intense than before, was distinctly seen. Several experiments were made with beers to which glycerin was not added; but treating them in the way described no green color could be obtained. It was noticed that the consistence of the residues from beers to which glycerin had been added, compared with the residues of beers containing no glycerin, was very different. The former were, of course, moist and syrupy, while the latter were much harder and even brittle.

Glycerin in Wine.—To some sherry wine was added 1 per cent. of glycerin. Of this solution 50 cc. were evaporated to dryness over a water-bath. The residue was treated, as previously described, with 25 cc. of absolute alcohol. The alcohol solution was then evaporated over a water-bath nearly to dryness, and a few drops of water added. This solution, made faintly alkaline and tested, gave the green flame distinctly. The same wine without glycerin gave no green color to flame.

Glycerin in Milk.—100 cc. of milk, to which 1 per cent. of glycerin was added, were evaporated to dryness over a water-bath. The residue was treated with 50 cc. absolute alcohol, and the alcoholic solution so obtained evaporated to dryness as before. A few drops of water were added, and the mixture filtered through a moistened filter to separate fat. The filtrate was then rendered alkaline and tested. The green color was distinctly observed. 100 cc. of milk without

glycerin similarly treated gave no green color. The fat of milk likewise gave no color reaction.

Glycerin in Treacle.—50 cc. of treacle, in which was dissolved by aid of heat and agitation 5 per cent. of glycerin, were, while warm, well agitated with absolute alcohol. The mixture was set aside, and allowed to cool and separate. The alcoholic solution was then decanted, and evaporated over a water-bath to dryness. This residue was treated with 50 cc. of absolute alcohol in the usual way, and the alcoholic solution so obtained evaporated over a water-bath to dryness. This second residue was treated in the same way with 25 cc. of absolute alcohol, and the solution obtained was evaporated as before. The residue was diluted with a few drops of water, and the solution made faintly alkaline. Tested, it gave the green color distinctly. A 1 per cent. solution failed to give the reaction, thus showing at the same time that treacle itself treated in this way is incapable of producing the green color.

It may be said then of the test for glycerin here proposed that it is practically characteristic, and is delicate. It can be easily applied, and is not interfered with by the presence of a considerable quantity of foreign matter. We therefore commend it to trial by chemists as a substitute for the known tests for glycerin, which are not only few but objectionable.

In conclusion we have to express our indebtedness to Mr. H. G. Greenish for valuable assistance, and to Professor Attfield for kindly permitting these experiments to be conducted in the Laboratories of the Pharmaceutical Society.

AUTHORS' NOTE.—In the discussion which followed the reading of the above paper our attention was directed to the fact investigated by Woodcock ("Jour. Chem. Soc.," xxiv, 785), that ammoniacal salts have the power of decomposing borax and liberating boracic acid. It was suggested that these salts might be mistaken for glycerin unless further precautions were taken. We find this to be the case.

Substances to be examined for glycerin by the test we have suggested should be first tested for ammonia, and should this be present the above methods must be so modified as to secure its complete exclusion. To determine the presence of ammonium salts, sodium carbonate, and in some cases the Nessler reagent, should be employed. The following

two experiments will suggest how ammonium salts may be separated. When fats occur they must, of course, be removed prior to treatment with alkali.

50 cc. of an aqueous solution containing 1 per cent. each of ammonium chloride and glycerin, were evaporated in a platinum dish over a water-bath to dryness. Saturated solution of sodium carbonate was then added, and the heat of the water-bath continued until no more ammoniacal gas was evolved, and the mixture was distinctly alkaline. The mixture was then extracted with absolute alcohol, and the solution evaporated, neutralized and tested. The green color was distinctly seen.

50 cc. of beer, containing 1 per cent. each of ammonium chloride and glycerin were evaporated to dryness over a water-bath. The ammoniacal salt was separated from the residue as before. The mixture thus obtained was treated with absolute alcohol, as described in the paper, and tested, the final solution being neutral, or only faintly alkaline. The green flame was very distinct. 50 cc. of beer containing ammonium chloride only were examined in the same way, but gave no green color to flame.—*Jour. Chem. Soc.* [London], September, 1878.

KINATE OF QUINIA FOR HYPODERMIC INJECTION.

By Henry Collier, Guy's Hospital.

I have on several occasions been called upon to make a solution of quinia for hypodermic injection, and as the ordinary salts of quinia (the sulphate and hydrochlorate) are not very soluble in water, the subject has always been with me a very unsatisfactory one.

This method of administration is desirable when the patient is so constantly sick that quinia cannot be given by the stomach, and in such cases the principal object in giving the remedy is to reduce temperature. Large doses are also required.

Solutions intended for hypodermic use require to be neutral, and of such a strength that a few minims only are needed for injection. I have prepared a solution of ordinary quinia sulphate, containing 1 grain in 10 minims, by heating the quinia and water in a beaker, and adding just sufficient dilute sulphuric acid to dissolve the quinia; but of course the solution had a very acid reaction. In one case, however, in which this was employed, the patient did remarkably well, and no irritation

was produced by the punctures. I have made some of the so-called neutral sulphate of quinia, but even after a second crystallization its solution was very acid, and it was not more soluble than 1 in 10. Hydrochlorate of quinia is fairly soluble in warm water, and such a solution has been injected warm, but the result was not satisfactory. In Parrish's "Practical Pharmacy" it is stated that kinate of quinia is soluble in 4 parts of water, and a process is given for its preparation direct from cinchona bark. I, however, procured from Mr. Morson some kinate of calcium, which I converted into barium kinate. This salt is freely soluble in water, and upon adding to its solution sulphate of quinia, in powder, the whole of the barium is precipitated and kinate of quinia remains in solution. Upon evaporation the kinate comes out in amorphous masses; even when evaporated under the air-pump over H_2SO_4, the same result is obtained. A drop of the same solution spread over a glass slide and evaporated slowly, shows under the microscope very distinct crystalline tufts. The plan I adopt is to reduce the solution of kinate to dryness over a water-bath, and then powder the residue. The kinate obtained by slow evaporation at ordinary temperatures contains a large quantity of water, some of which it loses by keeping at 90°F., so that to insure a definite product it is necessary to dry it.

Kinate of quinia is very soluble in water, and its solution is perfectly neutral. The strength of the solution which is used at this hospital is 1 in 4. I generally prepare ℥i of the solution at a time, by putting into a beaker ʒvi aq. destil. and ʒii kinate of quinia, heating until the salt dissolves, which it does almost immediately, and then making up with aq. destil. to ℥i. It is quite possible to make a permanent solution containing 1 in 3, but I find that 1 in 4 is more convenient for use. Even with this strength the syringe requires constant washing and the solution great attention, as the stopper and neck of the bottle soon become coated with solid kinate. Kinate of quinia has so far given satisfaction, and as it possesses the two great attributes of solubility and neutrality, I think that perhaps this salt will supply a want which has existed.

M. Yvon, in the "Jour. de Phar. et de Chim.," recommends the use of lactate of quinia for hypodermic injection, and in "L'Union Pharm." of last May, the sulphovinate of quinia is stated to be very suitable for the same purpose. It would be interesting to know what results have followed the use of these salts.—*Phar. Jour. and Trans.*, Aug. 10, 1878.

THE ALKALOIDS OF VERATRUM SABADILLA.

By C. R. ALDER WRIGHT, D.Sc. (Lond.), Lecturer on Chemistry, and A. P. LUFF, Demonstrater of Chemistry in St. Mary's Hospital Medical School.

After giving the history relating to the chemical investigation of Sabadilla seeds, the authors report in detail the results of their investigations, which are summed up in the following *general conclusions:*

(1.) The seeds of *Veratrum Sabadilla* (sometimes designated *Veratrum officinale*, *Sabadilla officinarum* or *Asagræa officinalis*) contain an alkaloid, first isolated by Couerbe, and termed by him *veratria*, which is indicated by the formula $C_{37}H_{53}NO_{11}$, or one very close thereto; this is non-crystalline, but furnishes certain crystallizable salts: on saponification it splits up into veratric acid (dimethyl-protocatechuic acid) and a new base, *verina*, thus, $C_{37}H_{53}NO_{11}+H_2O=C_9H_{10}O_4+C_{28}H_{45}NO_8$.

(2.) In addition, a considerably larger quantity of another alkaloid is present, first isolated by Merck, and described by him as "veratria." To distinguish this from the former alkaloid, which has the prior claim to the name veratria, we propose to term it *cevadina*, reserving the name veratria for Couerbe's base. This cevadina is crystallizable, melts at 205° to 206°, and on saponification splits up in accordance with the reaction, $C_{32}H_{49}NO_9+H_2O=C_5H_8O_2+C_{27}H_{43}NO_8$, forming a base *cevina*, and an acid identical with the methyl-crotonic acid of Frankland and Duppa, and with the cevadic acid of Pelletier and Caventou.

(3.) The formulæ assigned by Merck, by Weigelin and by Schmidt and Köppen to cevadina are all more or less erroneous, that of the latter pair of chemists being nearest to the truth, $C_{32}H_{49}NO_9$.

(4.) There is no good reason for supposing the existence of isomeric modifications of cevadina (so-called "veratria") in the sabadilla alkaloids, these supposed bodies being either mixtures of bases, thereby rendered highly difficult to crystallize, or products of alteration by saponification of the above-named bases.

(5.) The body described as "sabadillia" by Weigelin was not to be found in the substances examined by us; neither in the alkaloids extracted by ourselves by the tartaric acid process, nor in the commercial so-called "veratria" obtained from Hopkin and Williams, nor in the product purchased as "sabadillia" from Burgoyne and Burbidges. On the other hand, the first and last of these substances contained an alkaloid almost insoluble in ether, and agreeing in that respect with

"sabadillia," but non-crystalline and insoluble in water, and differing therefore in these respects; this body gave numbers agreeing with $C_{34}H_{53}NO_8$, and on saponification appeared to form cevadic acid. To indicate this latter fact and to connote its partial resemblance to "sabadillia," we propose to term it *cevadillina.*

(6.) The "sabatrina" of Weigelin is doubtless simply a mixture of resonoid alteration-products, as is also Couerbe's "hydrate of sabadillia."

(7.) The sabadilla alkaloids are not merely constituted like the aconite bases (*i. e.*, as regards saponification and in the case of cevadina, hydroxylation), but they also contain nitrogenous radicles, which appear to be closely allied to those of the aconite alkaloids.—*Jour. Chem. Soc.* Aug., p. 358.

MORPHIA REACTIONS.

By David Lindo.

During the analysis of a complex mixture it was noticed that the aqueous solution exhibited an intense green color. This solution was found to contain ammonia and copper salts with organic matter, which proved to be morphia. I have not seen this color-reaction mentioned before, and as it might sometimes prove useful as a confirmatory test for morphia, I have endeavored to ascertain the conditions most favorable to its development. These appear to be as follows:

Dissolve 1 part crystallized sulphate of copper in 10 parts of water; add solution of ammonia cautiously and with active stirring until the precipitate is just dissolved.

To ascertain if this solution is fit for the intended purpose, dissolve 2 grains muriate morphia in 1 ounce of distilled water; place some of this in a test-tube, add a few drops of the test-fluid and shake the vessel slightly. If a precipitate or permanent turbidity is observed, the test-fluid requires a little more ammonia, which should be added in small quantity at a time, and the mixture well shaken after each addition, as a notable excess prevents the test from acting. Adding ammonia to the morphia mixture that is being tested to rectify deficiency in the test-fluid will not be found to answer.

When a few drops of a properly-prepared test-fluid are added to a neutral solution of morphia salt of the above strength, and the tube is slightly shaken, no cloudiness will be observed, but the fluid assumes a

magnificent emerald-green color, either immediately or after a short time. Weaker solutions may require to be gently heated, but the mixture must not be boiled or the reaction is destroyed, suboxide of copper being precipitated.

Of a stronger solution of morphia salt one drop is sufficient to give a good reaction on a white porcelain surface. The test-fluid should be applied on a slender glass rod, and stirred in as soon as it is taken from the bottle.

If the copper solution has not been added in sufficient quantity the color obtained will be yellowish-green. Large excess of the reagent destroys the reaction, and so does the addition of a few drops of liquor ammonia.

Phenol is the only other colorless organic compound I have met with as yet which affords a similar color-reaction with the test, but further experience on this point is desirable.—*Chem. News*, Aug. 9, 1878.

Falmouth, Jamaica, June 25, 1878.

GNOSCOPINA.

By T. and H. Smith.

In the mother-liquors from the purification of narceina we have now repeatedly met with a crystalline body, which, distinguished at first from the principles more generally met with in opium by its melting point and its slight solubility in spirit, was, upon closer examination, ascertained to be a hitherto unknown alkaloid, and which we have named Gnoscopina.

This principle is characterized by forming readily crystallizable salts, which have an acid reaction. That its salts possess this reaction, as also the fact that gnoscopina is quite insoluble in water and in alkalies, marks its strong resemblance to the papaverina group. Hence, also, it is easily separated from narceina, which is moderately soluble in boiling water, and freely so in alkalies.

Gnoscopina when pure (after being repeatedly crystallized from boiling spirit) forms long thin white needles, having a woolly character when dried. It is soluble in 1,500 parts of cold spirit. It melts at 233°C., decomposing, however, at the same time, and burning with a smoky flame, leaves a skeleton of charcoal that burns entirely away at

a high temperature. It forms a muriate which crystallizes in glassy prisms, apparently containing water of crystallization, which is lost at a moderate heat. A solution of this salt gives a buff-colored crystalline precipitate with platino-chloride of potassium, and a white precipitate with iodide of mercury and potassium. In pure sulphuric acid, gnoscopina dissolves with a slightly yellow color, which becomes at once carmine-red upon the addition of a trace of nitric acid, and remains so. In this respect gnoscopina differs from rhœadina, which assumes this red color upon the addition either of sulphuric or hydrochloric acid alone. Gnoscopina is insoluble either in aqueous or in spirituous solutions of caustic soda, also in mineral spirit, and in fusel oil, but is soluble in chloroform and bisulphide of carbon and slightly so in benzol.

According to the following analyses, the formula of gnoscopina is $C_{31}H_{36}N_2O_{11}$:

(*a*) Weight of substance taken, 0·2840 gram.
H_2O obtained, =0·1455
CO_2 " =0·6565
(*b*) substance taken, 0·3105
H_2O obtained, =0·1562
CO_2 " =0·720
(*c*) substance taken, 0·4563
Volume of N obtained, 16·2 cc.=0·01996 gr.
Temp., 9·0°C.; Barom., 755·7 mm.

from which there follows:

	Calculated.	Found.			
		a.	*b.*	*c.*	Medium.
C_{31}	62·96	63·04	63·24	——	63·14
H_{36}	5·56	5·69	5·59	——	5·64
N_2	4·32	——	——	4·37	4·37
O_{11}	27·16	——	——	——	26·85

A specimen of pure crystals of this alkaloid is shown in our case at the Paris Exhibition.—*Pharm. Jour. and Trans.* [Lond.], Aug. 3, 1878.

THE BLUE SOLUTION OF MOLYBDIC ACID AS A REAGENT.

By O. Maschke.

If calcium molybdate is moistened with a quantity of dilute hydrochloric acid sufficient to produce a clear solution on the application of a gentle heat, a deep blue coloration quickly appears in the liquid. In place of calcium molybdate those of ammonium, sodium or potassium may be used, adding so much hydrochloric acid that the liquid if poured upon a plate of polished marble may produce a visible but very slight effervescence. If after cooling a concentrated solution of sodium or calcium chloride is poured into the liquid there is formed a blue-black precipitate, not easily distinguished in the liquid, and which may be regarded as a compound of molybdic acid and molybdic oxide. It dissolves with great ease, not merely in water but also in alcohol, and produces a coloration of extraordinary intensity. The author prepares the solution as follows: 3 grams calcium molybdate, 250 cc. of water, and enough of hydrochloric acid to effect the solution of 2 grams of cane- or grape-sugar. When the deep blue coloration is apparent the ebullition is continued for five minutes. When the precipitate has been produced with sodium or calcium chloride, it is washed upon the filter first with the precipitant and then with a little water. As soon as the liquid begins to run through of a deep blue color, the filter with its contents is placed in distilled water and the solution finally made up to 250 cc. This blue solution is decolorized with extreme ease by caustic alkalies and oxidizing agents, such as chlorine, nitrous acid, hydrogen peroxide and permanganic acid. Hydrochloric acid of spec. grav. 1·24 produces in this solution a blue precipitate, the supernatant liquid being colorless. Sulphuric acid of spec. grav. 1·840 does not give a precipitate, but the color of the liquid is altered. Nitric acid of spec. grav. 1·185 produces a rapid decoloration. Dilute solutions of ferric salts decolorize, and those of ferrous salts occasion turbidity. The author has endeavored to employ the blue solution to detect nitrous acid in spring waters. The water under examination is mixed with a little caustic soda; after filtration, so much acetic acid is added that the liquid may have but a very feeble acid reaction. A test-tube is three-fourths filled with this liquid and about 6 to 10 drops of dilute acetic acid and 1 to 2 drops of the blue molybdic solution are added, so that, in placing the tube upon a white surface and viewing it longi-

tudinally, only a very slight blue coloration may be perceived. Water containing only some tenths of a milligram of nitrous acid per liter will certainly destroy the color in an hour. The rapidity and distinctness of the reaction are remarkably increased on heating the liquid mixture gently for a short time. Solutions of potassium nitrate, containing one-tenth of a millionth of nitrous acid per cc. are decolorized in a few minutes after being gently heated. A strong and prolonged heat is to be avoided. Attempts made at the titration of nitrous acid by means of the blue molybdic solution, have so far given unsatisfactory results. Still if we admit that 1 mol. of permanganic acid corresponds to 5 mols. of molydic oxide, it is easy to determine with precision the quantity of molybdic oxide contained in a liquid by titration with permanganate. It might therefore be possible to determine nitrous acid in a satisfactory manner by causing the blue solution of molybdic acid to react for a certain time, the length of which must be experimentally determined, and then titrating back with permanganate. The blue solution is not very stable.—*Chem. News* [Lond.], July 12, 1878, from *Zeitschrift für Anal. Chemie.*

SOLUBLE ESSENCE OF GINGER.[1]

By J. C. Thresh, Pharmaceutical Chemist.

Requiring some time ago a strong solution of the active principles of ginger which would mix with water or syrup without causing turbidity, I was led to make a number of inquiries and experiments, some of the results of which it is the purpose of this paper to communicate.

I found that most wholesale drug houses made and kept in stock a so-called soluble ginger essence, but in many cases the pungency was due to cayenne, and (with one exception) the pleasing aroma of ginger was woefully deficient.

I also obtained several receipts for this essence, but none of them gave satisfactory results. One ordered the powdered root to be percolated with a dilute alcohol, another with a mixture of spirit and glycerin, a third ordered a strong decoction of the ginger to be fortified and preserved by the addition of a weak tincture of cayenne, etc., but not one of them yielded a result possessing the full flavor and odor of the ginger from which it had been prepared.

[1] Read before the British Pharmaceutical Conference.

I then began to investigate for myself, and ultimately succeeded in making an essence which answered my requirements; but before giving the form for its preparation, allow me to say a few words about the varieties of ginger and of the essence, or rather B. P. strong tinctures, found in the market. On making the soluble essence from the B.P. strong tincture obtained from different houses, I was much struck by the varying qualities (judged by the odor) of the essences made therefrom. Most of the strong tinctures were of a deep red-brown color, and contained a large percentage of resinous matter in solution, and invariably the darker the tincture the more inferior the essence. These I have no doubt were made with Jamaica ginger of inferior quality, for I find that the cheaper kinds are much richer in resins, whilst they are equally poor with regard to the volatile aromatic principle. In the strong tincture the spirit conceals the aroma; hence it is difficult to compare the two specimens by their odor without diluting them. Let them be diluted, however, and then compare the essence prepared from fine Jamaica ginger and that made from an inferior variety. The difference is so surprising that I have heard an experienced chemist doubt whether the fragrant odor of the former was solely due to the ginger used.

To return to my subject. After finding a method of making the soluble tincture, and trying the effects of varying the proportions of the ingredients, the following form was fixed upon as yielding upon the whole the best results:

Take of finest Jamaica ginger in powder 1 pound; pour upon this 8 ounces of rectified spirit, and after allowing to stand for several hours add more spirit; percolate to 16 ounces. To this add 2 ounces of heavy carbonate of magnesia, agitate and add 24 ounces of water. Shake well and filter. If the filtrate is turbid the whole must be shaken with a little more magnesia and again filtered. The filtrate possesses all the aroma of the ginger, and a fair share of its pungency, and is of a pleasing yellow-brown color. After keeping a few days it becomes turbid and deposits slightly, but if again filtered appears to continue clear.

The action of the magnesia probably is partly mechanical, partly chemical, for the peculiar tint of the essence is undoubtedly due to the action of the hydrate of magnesia upon the ginger resin, and the precipitate which forms soon after the essence is first made is a com-

pound of resin and magnesia. I had suspected that the resin left in solution differed from that removed, but upon evaporating the soluble essence and examining the resinous residue I could detect no difference between them; moreover when dissolved in spirit, diluted and shaken with magnesia, most of it was removed from solution, and the magnesia compound resembled that first separated.

I have since found that calcium sulphate, calcium carbonate and charcoal powder are equally efficacious in removing the excess of resin, but the resulting solution is in all cases much paler in color, and probably when charcoal is used the odor may not be so strong. These no doubt act mechanically, causing the aggregation of the resin precipitated by the water; hence it is probable that any fine inert powder will answer as well as the magnesia.

A syrup made by mixing equal quantities of strong simple syrup and soluble essence is very suitable for using with gazogenes, and a weaker syrup might with advantage replace the unsightly preparation of the Pharmacopœia.

The belief that this subject would be of interest to many pharmacists, and that the results of my imperfect investigation would be of value to others, must be my apology for troubling the Conference with this paper.

Specimens of soluble essence and of syrup made therefrom are upon the table, at the service of any member who would like to examine them.—*Phar. Jour. and Trans.*, Aug. 31, 1878.

SOLUBLE ESSENCE OF GINGER.[1]

BY B. S. PROCTOR.

Commercial samples have no great alcoholic strength.

Essence of ginger made with strong spirit and diluted with water continues milky for a long time.

The same mixed with a little alum or sulphuric acid becomes clear after standing some time (a week or two?). The quantity of alum or acid requisite is not sufficient to impart any taste to the essence produced, and may be got rid of (the acid most completely) by mixing with pure carbonate of lime and filtering. A clear, pungent, aromatic essence is thus produced, which turns slightly opalescent when mixed with water.

[1] Read before the British Pharmaceutical Conference.

Mr. Umney thought that for this paper the Conference was much indebted to Mr. Thresh, especially the Irish members, for in no place of an equal population was the manufacture of aerated waters so extensively carried on. A good essence of ginger was still a desideratum. He had for some time been trying to make a good soluble essence. He had made considerable quantities by a process similar to that now indicated, but with the omission of the spirit, using dilute glycerin only. He found that this did not take up the resinous principle, but the essential oil only, and as far as he could judge, this essence was merely a solution of the essential oil. He was glad to find that Mr. Thresh was investigating this matter, as he had previously investigated capsicin very successfully, and he felt sure that if he carried on his experiments much benefit would result. There was no doubt the different varieties of ginger had a great effect on the resulting essence. He had tried all kinds, and had found some specimens of Jamaica ginger so mucilaginous that there was no doing anything with them. This process of exhaustion by spirits of wine and precipitation of resinous matter by means of some mechanical body, such as carbonate of magnesia, seemed a good one, but he was not prepared to say that the process was wholly mechanical. If crude animal charcoal were used he presumed it would have some chemical effect.

Mr. Savage said this was one of those practical papers which were always appreciated by the trade. Some time ago a ginger beer maker called upon him, and said that he was in the habit of using essence of ginger, but he always found the beer became opaque. He found the remedy was, instead of using strong spirit, to use it in the proportion now given, two of spirit to three of water. This did not dissolve the resin, and the compound was satisfactory.

Dr. Symes had found, in examining samples of ginger with regard to their suitability for preparing essence, that a good method was to prepare a small quantity by treating it with a small quantity of spirit and adding a few drops of the essence so obtained to a large quantity of water, say ten minims to an ounce of water. The water seemed to have the property of throwing up the flavor and making it apparent, and strong essences of ginger, which while they contained strong spirit were not readily distinguishable, could in this way be easily distinguished. The deep colored specimens referred to might have

been prepared from African ginger, which was very dark, but not of good flavor. His experience confirmed that of Mr. Savage, that if ginger were treated with dilute spirit in the first instance the same result was obtained as by dissolving in strong spirit and then precipitating the resin. But percolation was then apt to fail, because there would be a precipitation of a layer of resin on the surface of the marc which prevented the further percolation. Agitation with dilute spirit and lengthened maceration so as to allow the resin to subside appeared to be the most practical and efficient mode of working.

Mr. Hatch thought it probable that the darker fluid had been prepared from African ginger.

Mr. Groves asked if any one knew the nature of the resin which was rejected by the proof spirit.

Dr. Symes said he had never examined it.

Mr. Groves said he should imagine that the essence of ginger as made by Mr. Thresh was not quite so pungent as that made by maceration, which would contain the whole of the resin.

Professor Attfield said it had been affirmed that the flavor of the ginger resided in the oil, and the pungency in the resin. If that were so it would follow that if the resin were removed the pungency would be reduced to a similar extent; but then, as Mr. Thresh hinted, there might be two resins, one of which was pungent and the other not. He should suggest that Mr. Thresh examine the matter further, for he was evidently well fitted to carry out an investigation of this kind.

Mr. Draper referring to the remark of Mr. Umney that oil of ginger was quite a different preparation, said essence prepared from it did not give the same results as that obtained from the ginger itself. The oil of ginger came from Germany, and was said to be distilled from the ginger root. No varieties were given, but neither essence nor syrup of ginger could be made from it. Why this should be if the whole flavoring resided in the volatile oil was not quite clear. On the other hand, it did not seem to reside in the resin, because with this formula sixteen ounces of tincture were taken and added to twenty-four ounces of water, therefore necessarily precipitating the whole resin. What was left was certainly of considerable interest to pharmacists to determine. He took rather an exceptional interest in the subject, and should be glad if it were further investigated.

Mr. Abraham said the specimen of syrup furnished seemed to him very deficient in aroma although not in pungency.

Mr. Sumner said there was room for a great deal more research with regard to extracting the properties of ginger. One of his sons had given a great deal of attention to the subject, and his experience up to the present time had been that the pungency was in the resin, and the aroma in the soft part. Ginger might be separated into two distinct kinds, the soft floury ginger and the resinous, and his son had found that he got the aroma in the soft ginger, and the pungency in the resinous. With regard to the flavor no ginger could give the same flavor or anything approaching it as the Jamaica.

The President, in moving a vote of thanks to Mr. Thresh, said it seemed to him that the subject might be divided into two portions. If the object of the investigator was to get a preparation which was perfectly soluble in water that was one thing; but if it were to produce a mixture which should dissolve all the characteristic properties of the drug and produce them in a fluid form, that was another question altogether, the latter being by far the most interesting as it came into the category of inquiries which he rather thought in the future would attain more interest than they had up to the present time. Many present would be familiar with some work of Dr. Squibb, in which he had been endeavoring to show that almost every drug should be treated with a different menstruum. That seemed to be the tendency of Dr. Squibb's investigation, and already some curious results bearing upon it had been brought out. He should be disposed to think the ultimate analysis of ginger was still to be made. As far as obtaining simply a preparation soluble in water the problem was not a very difficult one, and Mr. Thresh seemed to have pretty well worked it out.—*Phar. Jour. and Trans.*, Aug. 31, 1878.

NITRITE OF AMYL.[1]

By D. B. Dott.

Nitrite of amyl is now admitted to be an important remedial agent, having taken its place in the national Pharmacopœia. Being a substance of great physiological activity, it is highly important that it should be obtained pure, or if that is impracticable that the preparation

[1] Read before the British Pharmaceutical Conference.

should be of constant strength. With the view of ascertaining whether either of these conditions holds good with the article in the market, I procured several samples from such sources that they may be regarded as fairly representative and submitted them to examination along with a quantity (*a*) prepared by ourselves. As there is considerable divergence in the boiling point of amylic nitrite as given by different authorities, the fraction 90°-100°C. was collected as correct. This portion had invariably the proper spec. grav. of ·877. The results of the examination are embodied in the table annexed.

Sample	A	B	C	D	E	F
Specific Gravity,	·877	·876	·864	·875	·875	·875
Below 90°, . . .	5·0	3·0	34·6	2·6	0·0	52·0
90°–100°, . . .	85·0	65·0	6·7	47·5	11·5	33·3
Above 100°, . .	8·0	28·0	51·7	45·7	83·9	11·4
Water, ...	0·0	0·0	1·8	0·0	2·2	0·0
Loss, ...	2·0	4·0	5·2	4·2	2·4	3·3
	100·0	100·0	100·0	100·0	100·0	100·0

These figures give the results of a single rectification. Of course, on again rectifying the lower and higher fractions an additional quantity of nitrite of amyl would be obtained; but the numbers are sufficient for the purpose of comparison. The samples C and E are of very poor quality, E being probably the inferior, because, although it apparently contains a larger percentage of amylic nitrite than C, it yields a large proportion boiling above 100°, the temperature rising to 230° before the distillation was stopped, leaving a black oily residue in the flask. The odor of this sample was quite different from that of genuine nitrite of amyl. It will thus be seen that out of five specimens examined, two were of very inferior quality. That it is difficult completely to separate the nitrite of amyl by rectification from the accompanying substances is shown by the numbers here given. The fractions boiling below 90° and above 100° from the sample F were rectified together in the same way as before, the process being repeated twice.

I. 59·0 cc. gave 13·0 cc. = 22·0 per cent. 90°—100°
II. 43·0 8·0 = 18·6
III. 33·5 5·0 = 14·9

In passing judgment, however, on such a substance as nitrite of amyl, the question meets us at the very outset, What degree of purity have we a right to expect in this body? In the case of amylic nitrite the ques-

tion is one of considerable difficulty, requiring for its elucidation the consideration of a number of facts. In the first place, I have ascertained that the fractions boiling below 90° and above 100° are for the most part either physiologically inert or have an action distinct from that of nitrite of amyl. There may, however, be several isomeric or metameric nitrites, whose boiling points differ and yet whose physiological action is the same. That this is the case seems probable from the varying boiling points given for amylic nitrite and amylic alcohol. Indeed two isomeric alcohols are known to exist. According to the authorities cited in Watts' "Dictionary," the boiling point of the nitrite varies from 91° to 96°. Tanner ("Year-Book of Pharmacy," 1872, 186) gives 95°-100° and Umney ("Pharmaceutical Journal" [3], i, 422) 98°-100° as the temperatures at which nitrite of amyl should distil. For amylic alcohol Gmelin gives boiling points varying from 127° to 134°, and even the more recent researches record apparently conflicting accounts. Schorlemmer found ("Proceedings of the Royal Society," xv, 131) that amyl alcohol, whether prepared from fusel oil or from American petroleum, boiled at 132°. On the other hand, Pedler ("Chemical Society's Journal" [2], vi, 74) gives 128° and 129° as the boiling points of the dextrogyrate and optically inactive alcohols, respectively. Without going further into the matter at present, I may say with certainty that there is an amylic alcohol or mixture of alcohols boiling at 128°-129°. This I have proved by rectifying a fraction repeatedly until it distilled entirely at 128°-129°, and then oxidizing the same with potassic anhydrochromate and sulphuric acid. It gave a yield of valerianic acid equal to 14 per cent. Other matters that have to be taken into account are possible inapplicability on the large scale of a process of preparation or purification that may work well in the laboratory, also that a sample honestly prepared by one method may contain impurities not existing in a sample prepared by another process. Not much importance need be attached to the spec. grav., as, on account of the lower fractions having a higher, and the higher fractions a lower spec. grav. than amylic nitrite, it is easy by a judicious blending to produce the desired density.

For the preparation of the nitrite two processes are given in the Pharmacopœia, "by the action of nitric acid or nitrous acid (N_2O_3) on amylic alcohol." Of these two I have no hesitation in pronouncing the latter to be the better. Whether it is the more economical may

be open to question. The objection of Hunge, quoted in the "Year-Book of Pharmacy," 1871, 225, that by this process a black non-volatile substance and a number of other impurities are formed, is unfounded. After passing the gas through for a sufficient length of time, the liquid is agitated with water, decanted therefrom and shaken up with sodic carbonate. The nitrite is now rectified, the portion passing over between 90° and 100° being retained. The amylic nitrite thus obtained has a spec. grav. of ·877. By repeated rectification, however, I have never been able to get more than 95 per cent. of distillate. This arises partly from loss in the distillation, but chiefly from decomposition which then occurs, there invariably remaining a residue boiling above 100°. The fact that decomposition does take place is proved by observing that while the liquid before distilling is quite neutral to test-paper, the distillate is strongly acid.

The results of one experiment are here given:

60·0 cc. gave	52·5 cc.	= 87·5 per cent., boiling at 90°—100°
52·5	49·5	= 94·2
49·0	46·5	= 94·8
46·5	44·0	= 94·6

Considering all the circumstances of the case it will readily be allowed that the fixing of a standard of purity for nitrite of amyl is, in the present state of our knowledge, a matter of difficulty and that it must be to a certain extent arbitrary. The British Pharmacopœia describes the liquid in question as boiling at 205°F. or 96°C. I can only say that no sample we have ever examined, whether purchased or prepared by ourselves, boiled constantly at that or at any other temperature, nor have I any reason to believe that such a perfect preparation has been produced. It is not, of course, for me to decide what tests medicinal amyl nitrite ought to answer; but I think it will be generally agreed that such products as those marked C and E are not altogether creditable to the profession of pharmacy.

Mr. Umney expressed his regret that nitrite of amyl was not to be found in a purer state now than it was seven years ago, when he went over precisely the same ground as that covered by the present paper. The physiological action of the nitrites of methyl, ethyl and amyl had been thoroughly worked out by Dr. Richardson. He believed that the *sine quâ non* in the manufacture of pure nitrite of amyl was a definite body, amylic alcohol, to start with, not ordinary fusel oil.

Professor Tichborne was very glad to find that Mr. Dott had confirmed a fact which he noticed many years ago in a work called the "Laboratory," which was afterwards denied by Mr. Chapman, one of the main authorities on nitrites. He then pointed out that nitrite of amyl was dissociated in the act of boiling into amylic hydrate and nitrous oxide gas; this was denied, as he had stated, by Mr. Chapman, and he was glad to find that recent experiments confirmed his observations.

Mr. T. B. Groves asked if Professor Tichborne had tried distillation *in vacuo* or in carbonic acid, so as to be out of contact with air.

Professor Tichborne said that at the time he performed the experiment he tried carbonic acid, and that had no effect; but he was not prepared to say what would be the result of distillation *in vacuo*. He fancied that the dissociation of the molecules was really a matter of temperature, and as distillation *in vacuo* could be carried on at a much lower temperature, that dissociation might be brought to *nil* or almost so.—*Phar. Jour. and Trans.* [Lond.], Aug. 31, 1878.

VARIETIES.

A Method of Distinguishing Gallic, Tannic and Pyrogallic Acids. By Wm. Watson, F.C.S.—To about $\frac{1}{2}$ grain of each acid in a little water add NH_4HO.

Gallic.	*Tannic.*	*Pyrogallic.*
Pink, rapidly changing to deep orange solution.	Same as gallic.	Lemon-colored solution.

To each ammoniacal solution add HNO_3.

Gallic.	*Tannic.*	*Pyrogallic.*
Red.	Purple precipitate insoluble in excess.	Red.

Substituting HCl for HNO_3.

Gallic.	*Tannic.*	*Pyrogallic.*
Red.	Pink precipitate soluble in excess.	Pink, quickly changing to red.

—*Phar. Jour. and Trans.*, July 20, 1878.

Process for the Detection of Alcohol in Ethereal Oils. By A. Drechsler.—The author uses a solution of 1 part potassium bichromate in 10 parts of nitric acid of spec. grav. 1·30. The new reagent shows the presence of even the smallest traces of alcohol in ethereal oils, as on its addition there is evolved, along with the specific odor of the oil, the well-known pungent smell of ethyl-oxide, whilst, at the same time, a very characteristic change of color occurs, which is very different, according to the quality of the different ethereal oils, and is best observed by using for the experiment small porcelain capsules shaped like a watch-glass. Five to six drops of the oil in question are poured into a capsule, two or three drops of the reagent are added, and the whole is let stand. In certain oils a remarkably beautiful play of color appears in the mixture.—*Chem. News*, Aug. 9, from *Chem. Ztg.*

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

American Pharmaceutical Association.—The President has issued the following

ANNOUNCEMENT.

The Twenty-sixth Annual Meeting of the American Pharmaceutical Association will be held in the City of Atlanta, Georgia, during the last week in November, beginning on Tuesday, the 26th, at 3 P.M.

In consequence of the general alarm produced by the rapid spread of that terrible scourge, yellow fever, in some of the towns and cities along the Mississippi, the officers and executive committee of the Association, having obtained the consent of our friends in Georgia, concurred in the desirability of postponing our Annual Meeting, which was appointed to be held in Atlanta on the first Tuesday in September, until some time in November. After further consultation with our Southern friends, as well as with many of our leading members in the North, the above date has been fixed on as most likely to meet the convenience of the greater number of those who would be disposed to attend. It is confidently predicted that long before the end of November frosts will have destroyed the germs of the pestilence, so that not the slightest apprehension need be felt of danger in the journey on this account.

I trust that as many of our members as possibly can will make it a point to attend this meeting, even at the risk of a little inconvenience to themselves. By turning out in good force we shall stimulate the progress of pharmacy in the South, and best show our sympathy for our fellow-laborers there in their efforts to elevate pharmacy and pharmacists to a higher position. We shall, also, by availing ourselves of this opportunity, have the privilege of exchanging a week or two of the most unpleasant part of the wintry weather of the North for that of the mild and genial atmosphere of the South. The proximity of the place of meeting to the far-famed winter resorts in Georgia and Florida will no doubt be an additional attraction to many. Let there be a hearty response to the cordial invitation extended by our Southern brethren, and a general rally around the standard of the A. P. A. in the beautiful city of Atlanta.

Applications for membership should be addressed to the Chairman of the Executive Committee, Geo. W. Kennedy, Pottsville, Pa. WM. SAUNDERS, *President.*

The Colleges of Pharmacy in the United States, with the exception of that of California, will have commenced their lecture season by the time this issue will be in the hands of our readers. From what we can learn at this early date there is a very good prospect of a fair attendance at all.

British Pharmaceutical Conference.—The fifteenth annual meeting was held at Dublin, Ireland, August 13 and 14, Mr. G. F. Schacht presiding. After the usual routine business had been transacted, the business of the meeting was continued by the reading of a report, by Dr. Wright and Mr. Luff, of some of the latest results they have obtained in the examination of the *aconite alkaloids.* These results have already been communicated to the Chemical Society, and partially published in its journal. To a great extent they consist of rectifications of those stated in the report presented last year to the Conference. Thus, for instance, it is now reported that the substance to which the name pseudaconitia was then applied was not a definite base, but, in fact, a mixture of that base with a decomposition product derived from it by removal of water. Consequently the authors now propose the formula $C_{36}H_{49}NO_{12}$ in place of that which they gave last year as indicating the composition of pseudaconitia. This alkaloid is described as crystallizing with one molecule of

water which is separable below 100°. It is now found also that some salts of pseudaconitia are crystallizable; for instance the nitrate, which is described as being obtainable by rubbing the approximately pure alkaloid in a mortar with dilute nitric acid in slight excess. Another result is the alteration of the formula of pseudaconina, the product described last year as being formed by the action of acids upon pseudaconitia. The authors now propose to represent this as $C_{27}H_{41}NO_9$ instead of $C_{27}H_{41}NO_8$. This alteration is of course a necessary consequence of the above-mentioned rectification of the formula of pseudaconitia, if the production of pseudaconina from it is to be represented as consisting in the splitting up of pseudaconitia into pseudaconina and dimethylprotocatechuic acid. That decomposition of pseudaconitia, however, is now described as being accompanied by another alteration, which consists in mere dehydration of pseudaconitia and furnishes a product which the authors call apopseudaconitia. The composition of this substance is represented by the formula $C_{36}H_{47}NO_{11}$. It is described as a base closely resembling pseudaconitia and easily obtained by heating that substance with dilute hydrochloric acid, or with a large excess of tartaric acid solution for some hours. The substance described by the authors last year under the name of pseudaconina as resulting from the splitting up or saponification of pseudaconitia is now reported to have been in reality a product of another alteration. The production of this substance—now termed apopseudaconina and represented by the formula $C_{27}H_{39}NO_8$—is described as consisting either in the splitting up of apopseudaconitia or in the dehydration of pseudaconina formed by the splitting up of pseudaconitia itself. It is reported not to be formed at all when the temperature is 100°, or rather less, but to be readily formed at 140°. These are very radical modifications of the results reported last year, and they show that the general conclusions arrived at in these researches must be received with very great caution.

Another report on work done with the aid of a grant from the Conference research fund was that presented by Mr. W. A. Shenstone on *Brucia and the Constituents of Strychnos Bark*. The principal facts in this paper also have already appeared in this journal, having formed the subject of a paper read at an Evening Meeting of the Pharmaceutical Society of Great Britain during last session. It confirms Mr. Cownley's negation of Professor Sonnenschein's alleged conversion of brucia into strychnia by the action of nitric acid, and states that the yield of strychnia steadily decreases as additional processes of purification are employed, until it completely disappears. It also admits the important fact, previously pointed out by Mr. Cownley, that commercial brucia frequently, if not always, contains an admixture of strychnia, and the reporter gives a method for the purification of brucia from this contamination. Another point in the report is the statement that false angustura bark does contain a small quantity of strychnia.

This concluded the reading of reports, and the next paper read was *On the Volumetric Estimation of some Official Iron Preparations*, by Mr. H. N. Draper. The preparations referred to in the paper were ferrous arseniate, ferrous phosphate and magnetic oxide, and the point investigated was whether the quantities of bichromate of potash solution ordered in the British Pharmacopœia to be used in the volumetric estimation of these bodies are a fair indication of the products yielded by the Pharmacopœia processes. This the author answered in the negative, and in the dis-

cussion that followed Professor Attfield stated that he had always understood that no such indication was intended by the compilers of the Pharmacopœia.

Nitrite of Amyl was the subject of the next paper, sent by Mr. Dott, which is printed on page 499.

Some *Fragmentary Notes on Opium*, by Mr. B. S Proctor, followed, in which were discussed the variations in morphia strength of opium and some of its preparations, and the importance of using in pharmacy an opium of standard strength.

In calling attention to a *Soluble Essence of Ginger*, Mr. J. C. Thresh touched upon a theme of considerable interest to the audience. This and Mr. Proctor's paper on the same subject, together with the discussion, is published on page 494, etc.

In a second paper, Mr. D. B. Dott announced that he had succeeded in preparing a crystalline *Hydrochlorate of Beberia*, from the examination of which he hopes to be able to clear up the doubt existing as to the composition of the base.

The *Titration of Hydrocyanic Acid and Cyanides* and its relation to alkalimentry, was the title of the next paper read, which was by Mr. L. Siebold. The author points out that in using Liebig's process for determining the strength of hydrocyanic acid it is better to use an excess of alkali than a deficiency, but that if exact results are desired they may be attained by using an excess and adding standard normal sulphuric or hydrochloric acid to the mixture at the close of the titration, until the slight opalescence produced by the silver nitrate begins to increase, which will not occur until the excess of alkali has been neutralized. For every cubic centimeter of sulphuric acid required, 0·01 cc. must be deducted from the volume of the silver solution used, and the rest calculated as hydrocyanic acid. A modification of the process was also described for analyzing mixtures of potassium or sodium cyanide and free hydrocyanic acid, as well as its applicability to alkalimetric operations.

In the discussion that followed the reading of this paper, Mr. Williams made an interesting addendum to his paper, read at a former meeting of the Conference, on the power of glycerin to prevent the diffusion of hydrocyanic acid. He stated that a solution, made three years ago, containing 37½ per cent. of hydrocyanic acid, 37½ per cent. of glycerin and 25 per cent. of water, had been found, on testing it a week ago, still to contain about 37 per cent. of the acid.

The importance of the pharmacist acquiring a *Knowledge of Vegetable Histology* was then advocated by Mr. T. Greenish, and its value was demonstrated by reference to enlarged drawings of sections of a sample supplied as senega root, which, from its general appearance and the inferior decoction it yielded, was suspected not to be genuine. A histological examination, however, proved it to be a true root of *Polygala Senega*, although immature, and that its inferior pungency was coincident with a deficiency in the cortical layer which Schneider has shown to be the seat of the active principle.

Mr. T. B. Groves then described a *Miscible Copaiba* that he had obtained by treating Maranham balsam with a saturated solution of potassium carbonate. It resembled ordinary copaiba in appearance and consistence, but was alkaline, and when shaken with water, instead of floating on the surface it readily formed a white emulsion, more or less stable according to the degree of dilution.

Baycuru, the title of a paper by Dr. Symes, is the name of a Brazilian drug, yielded by the *Statice Brasiliensis*, which the author thinks is worthy of trial in this country.

It is used in Brazil as an astringent and discutient remedy in cases of enlargements and glandular swellings.

Under the cover of a note on *Authoritative Formulæ for Non-Official Preparations*, the junior Honorary Secretary of the Conference, Mr. Benger, levelled an attack at the recent magisterial decisions in the north, that the sale of a mineral substance under the name of "Violet Powder" is an offence against the Sale of Food and Drug Act. The tone of the paper may be gathered from the fact that the persons convicted were described as men in a highly respectable position, who had suffered pecuniary loss, annoyance and vexation "through failing to recognize as authoritative, formulæ published in Gray's 'Supplement' and similar works." Of course, this is a subject upon which there exists a diversity of opinion, and it threatened to lead to a lively discussion. But the time of adjournment had arrived, and there yet remained one more paper on the list.

A *Perfumed Solution of Iodoform* was the subject of the last paper for the day, by Mr. G. A. Keyworth. This is prepared by shaking tincture of iodine with a fragment of fused potash until the color is removed and covering the odor of the iodoform produced by the addition of eau de cologne or lavender water. The author also speaks of lint that has been dipped in this liquid, and afterwards dried, as being a very good application to indolent sores.

The proceedings on Wednesday were commenced by the reading of a paper on an *Improved Preparation of Ergot*, in which Mr. A. W. Postans recommends one resembling the United States fluid extract in containing glycerin, but without the acetic acid. It is obtained by maceration and percolation of freshly-powdered ergot with a mixture consisting of two parts each of rectified spirit and glycerin and one of water, displacing with water, and evaporating the last runnings in a water-bath so that one ounce of the united products shall represent one ounce of ergot.

The next paper, entitled a *Comparison of the Strength of some of the Cinchona Preparations*, by Mr. C. Ekin, was perhaps the most important and valuable communication read during the session. It was followed by another on the *Assay of Cinchona*, by Mr. J. B. Smith. Mr. Ekin had taken a sample of calisaya bark of good appearance, treated it by De Vrij's method, so as to obtain the total alkaloids, and then prepared from the same bark for the purposes of comparison, a tincture, infusion, decoction and fluid extract. From these results the following percentages of total alkaloids were obtained: bark, 1·96; tincture, 1·89; infusion, 1·31; decoction, 1.26 and fluid extract, only 0 47 per cent. From this it appears that the proof spirit of the tincture had nearly exhausted the bark, the boiling water of the infusion and decoction had taken up about five-eights, while the cold water of the fluid extract of the British Pharmacopœia took up, or at any rate, only retained about one-fourth. In the discussion, Mr. Umney made some confirmatory remarks as to the waste involved in making the B P. liquid extract, and Mr. Brady mentioned the significant fact that quinia manufacturers are always ready to buy from pharmacists the residues left in the preparation of fluid extracts. Mr. Umney also remarked on the inferior quality of Calisaya bark now met with in commerce, and said he looked to India or Java for the barks of the future, while Professor Markoe says that even now the East India barks are preferred in the United States.

The next paper, by Mr. Geo. Brownen, was one of practical pharmaceutical interest, as it dealt with the *Recovery of the Emetia* contained in the unsightly deposit that forms in ipecacuanha wine. This may be done, the author says, by making the semi-crystalline mass into a paste with water, which is rendered alkaline with calcined magnesia, dried, powdered and exhausted with alcohol. The alcohol is evaporated, and the crude alkaloid purified by dissolving it in dilute acetic acid and precipitating with ammonia. The emetia is thus obtained tolerably pure, as a fawn-colored powder. Mr. Brownen also suggests whether the uncertainty and partial inertness of old ipecacuanha wine may not have another cause in the conversion of the emetia into the gallo-tannate of the alkaloid, which, according to Watts, is "neither emetic nor poisonous."

In a lively paper on the *Adulteration of Drugs*, Professor Tichborne quoted several instances of adulterated drugs that had come under his notice, some of them being substances of such low price as to appear hardly to allow of gain being made by their sophistication. Although the author stated that the gathering of the materials used in the paper had gone on during many years, and indeed some of them are hardly to be met with now, a vigorous and well-founded protest was uttered by Mr. Boileau and succeeding speakers against any inferences being drawn from it or from some remarks made by Dr. McSwiney adverse to the commercial morality of the drug grinders or druggists of Dublin. The paper gave rise to the most prolonged discussion that took place during the Conference, in the course of which more than one speaker expressed an opinion that the subject had been treated in a somewhat exaggerated and one-sided manner by the author.

A method of distinguishing the presence of *Carbolic Acid or Cresylic Acid in Creasote* was then described by Mr. A. H. Allen. The necessity of including cresylic acid was explained on the ground that if wood tar creasote were adulterated with coal tar acids, not pure carbolic acid would be used, but a low class product containing a considerable quantity of cresylic acid, which in many respects behaves more like creasote than carbolic acid. The method is based upon the difference in the boiling-points of these bodies and the difference of the solubility in glycerin and in collodion.

Two papers by Mr. R. Reynolds and Mr. C. H. Bothamley followed. The first referred to the pink coloration produced in *Orange Flower Water by Nitric Acid*, which the authors had found was no longer produced when the essential oil had been removed from the water by ether. The question was started during the discussion as to what ought to be dispensed when orange flower water is ordered in a prescription, the "triple water," as imported, or diluted. Some diversity of practice was disclosed, dependent apparently upon the speaker looking upon the water as being ordered simply as a flavoring agent, or possibly for its hypnotic properties. The other paper, by the same authors, was a report on the *Examination of Various Samples of Dialyzed Iron*. Mr. Gerrard communicated the results of an investigation of the New Zealand drug "pituri," and announced that he had succeeded in separating from it an alkaloidal substance, which he thinks will probably prove to be the active principle and proposes to call "pituria." Mr. Gerrard also commu-

nicated a method of *Preparing Phosphorus Pills*, in which he takes advantage of the density of chloroform vapor to preserve the phosphorus from contact with atmospheric air during the manipulation of the pill mass.

In the next communication, Mr. C. W. Fletcher described an interesting compound which has the composition of a *Triodide of Bismuth and Hydriodate of Quinia*. This was followed by some *Laboratory Notes* by Mr. H. Barton, and the reading of papers was brought to a close by a note on Reichert's *Improved Thermal Regulator* by Dr. Symes.

The Conference then turned its attention to the arrangements for its next meeting, and Mr. Ward, on behalf of the pharmacists of Sheffield, gave a hearty invitation to the members to meet next year in that town. This it was decided to accept. The election of officers, Mr. Schacht being again chosen President, and the passing of various votes of thanks brought the meetig for 1878 to an end.—*Phar. Jour. and Trans.* [Lond.], Aug. 17, 1878.

EDITORIAL DEPARTMENT.

The American Pharmaceutical Association.—For a number of years past we have been enabled to give in the October number of the "Journal" an account of the annual meeting of the American Pharmaceutical Association, which was usually held during the month of September. The causes which have led to its postponement this year are familiar to all our readers. The yellow fever, though abating in severity, is still carrying off its victims, but with the season near at hand when frosts may be expected even in many portions of our Southern States, the scourge will doubtless have spent its fury before another month has passed, and not only be on the decline, but have disappeared from most, and let us hope from *all* the infected districts.

The Association resolved to meet this year in the heart of the Southern States, with the view of enlisting the active co-operation of the pharmacists and druggists of that section of our country. That object would have failed if the meeting had been held at a time while sections from which a large attendance had been confidently expected were suffering from the visitation of that terrible plague. But the reasons why the national Association should go South are still the same, and the necessity is, if possible, still more urgent than it was a year ago. We are pleased to learn that this view is gaining more ground in all sections of the country, and that members who were rather inclined to forego the pleasure of meeting their associates, on account of the distance, are endeavoring to arrange their affairs so as to permit of their temporary absence from their homes and their pursuits at a season when they were usually at their posts of duty. It is the conviction which is gaining ground that it is no less a duty to further the objects and interests of the Association, and that this duty is more imperative now, when that beautiful section of the North American continent, whose interests were to be specially enlisted, has been suffering to so great an extent. The warm sympathy which fills every heart will show itself, we have reason to hope, in an increased attendance from the East-

ern, Middle and Western States, and it is particularly desirable that all those who may have been appointed delegates should be present. The Secretary has already received many letters from members signifying their intention not only of going themselves, but likewise of urging the lukewarm to remove the little obstacles which may be in the way and threaten to interfere with the visit to Atlanta. Many ladies are expected to accompany the members and delegates, and there will be no difficulty in arranging pleasant excursion parties by those who feel a desire to visit one of the fairest sections of the South at a season when in the more northern States the severity of the wintery season is already beginning to be felt.

While we, therefore, on the one hand, look confidently for agreeable social enjoyment in company with the friends of the Association, we believe also that the intellectual treat will well repay a visit to Atlanta. Many reports and papers of scientific and general interest will be read; several members who it was feared would be prevented from coming if the meeting was held later than September will be present, and the exhibition of objects of pharmaceutical interest is promising to prove quite an attraction; a valuable contribution to this meeting will be a collection of California drugs which have been forwarded by Mr. J. G. Steele, of San Francisco, and we hear of other exhibits being prepared in various places besides those which have already been forwarded and have been in the custody of the Local Secretary for more than a month.

In referring to the official announcement of the President, which we print in another place, we take occasion to urge upon the members living in the Eastern, Northern and Western sections to rally in force and now begin the preparations for a visit to Atlanta on the 26th of November. They may be sure of a hearty Southern welcome.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Elementary Quantitative Analysis. By Alexander Classen, Professor in the Royal Polytechnic School, Aix la-Chapelle. Translated, with additions, by Edgar F. Smith, A. M., Ph.D., Assistant in Analytical Chemistry in the Towne Scientific School, University of Pennsylvania. Philadelphia: Henry C. Lea, 1878. Pp. 328.

Classen's little work on quantitative analysis has deservedly met with much favor, as being well adapted for the introduction into that difficult branch of chemistry, viz., the complete separation of the different elements from one another, in such combinations that each may be correctly determined by weight. The method chosen by the author is that of teaching by means of examples, commencing with simple compounds, followed by methods of separation, the determination of alloys, minerals, waters, ashes and a number of products largely employed in the arts. From this brief sketch it will be observed that the work is in the first place intended as an aid to the student on his first entry into the department of quantitative analysis; at the same time, however, it will be found a useful work of reference to the more advanced student and to the practical analyst, inasmuch as it points out processes and methods of separation which may find frequent application. While the

work is not intended to supplant the larger ones by Fresenius, Rose and others, it serves the important purpose of leading to their better appreciation.

The translator and editor has carefully attended to the task before him, and the publisher has given the work an attractive garb, not the least useful of which are the wood-cuts in illustration of apparatus and processes.

Medicinal Plants; being Descriptions with Original Figures of the Principal Plants employed in Medicine, and an Account of their Properties and Uses. By Robt. Bentley, F.L.S, and Henry Trimen, M.B., F.L.S. Parts 31 and 32. Philadelphia: Lindsay & Blakiston, 1878. Price per part, $2.

The two parts before us contain excellent plates, with descriptive text of the following medicinal plants: Alpinia officinarum, *Hance* (Galangal); Astragalus gummifer, *Labill.*; Butea frondosa, *Koen.*; Carum (Ptychotis, *D. C.*) ajowan, *Bentl.*; Citrus bergamia, *Risso*; Copaifera Langsdorfii, *Desf.*; Garcinia indica, *Choisy* (oil of mangosteen); Juglans cinerea, *Lin.*; Manihot utilissima, *Pohl*; Pilocarpus pennatifolius, *Lem.*; Pinus balsamea, *Lin.*; Pinus tæda, *Lin.*; Quercus alba, *Lin.*; Quercus tinctoria, *Bartr.*, and Zingiber officinale, *Roscoe.*

The Antagonism of Therapeutic Agents, and What it Teaches. By J. Milner Fothergill, M.D. Philadelphia: Henry C. Lea, 1878. Pp. 160.

The Fothergillian gold medal of the Medical Society of London for 1878 was awarded to this essay, which will be found highly interesting to the observers and inquirers into the antagonistic action of toxic agents. The work commences with accounts of experiments tending to illustrate the subject, and follows this up by critical inquiries into the action of poisonous drugs. The application of the results of these inquiries in cases of actual poisoning and in ordinary practice concludes the author's task.

The essay is tersely written, and contains many practical hints and suggestions.

Bibliotheca Medica. A Catalogue of American and British Books, Periodicals, Transactions, etc., relating to Medicine, Surgery, Dentistry, Pharmacy, Chemistry and Kindred Subjects. Cincinnati: Rob. Clarke & Co., 1878. Pp. 244. Price, 25 cents.

This pamphlet, we think, will be welcome to many of our readers, embracing as it does a list of the titles, together with the price of the works published, as stated on the title page. The whole is classified by subjects, and this is followed by an index by authors.

Pocket Therapeutics and Dose-Book, etc. By Morse Stewart, Jr., B. A., M. D. Detroit, Mich., 1878. Price, 50 cents.

This little book of 100 pages may be conveniently carried in the vest pocket, and will, we think, be found useful by those who need a remembrancer on the subject of doses and uses of even the most ordinary medicines. In our opinion it belongs to that class of books which are very useful to those who make the compilations for their own use.

Berberidaceæ. By C. G. and J. U. Lloyd. Cincinnati, 1878, Pp. 16.

A brief account of the medical and pharmaceutical properties of American berberidaceæ.

Arbeiten aus dem Pharmaceutischen Institute der Universität Dorpat, 1878.

Notes from the Pharmaceutical Institute of the University of Dorpat.

The pamphlet before us contains investigations on theobromina by O. Donker and C. Treumann, and an analysis of the bulbs of *Erythronium dens canis,* Lin., by Prof. Dragendorff.

Méthode d'Extraction des Pigments d'Origine Animale. Applications diverses du sulfate d'ammoniaque. Par C. Méhu. Paris. Pp. 7.

Method of Extracting Pigments of Animal Origin.

The essay was read before the French Academy of Medicine.

Address delivered before the American Medical Association at its Twenty-ninth Annual Session, held at Buffalo, June, 1878. By T. G. Richardson, M.D., of New Orleans, President. Pp. 21.

The American Medical College Association. Second Annual Meeting, held at Buffalo, N. Y., June, 1878. Pp. 10.

The Etiology and Prophylaxis of Blindness. By Dr. M. Landesberg, Philadelphia. New York: Wm. Wood & Co. Pp. 43.

Zur Statistik der Linsenkrankheiten. Von Dr. Landesberg, Philadelphia. Cassel: Theo. Fischer. Pp. 19.

Statistics of Diseases of the Lens.

Upon the Treatment of Strumous Disease by what may be called the Solfatara Method. By Hor. R. Storer, M.D., Newport, R. I. Cambridge, 1878. Pp. 10.

OBITUARY.

Alfred Daggett, Jr., has departed this life in the prime of manhood. He was a prominent pharmacist of New Haven, Conn., and one of the founders and officers of the Connecticut State Pharmaceutical Association and a member of the American Pharmaceutical Association.

William S. Folger died after a very short illness at Boston in the forty-third year of his life. He was born in Nantucket in 1836, was apprenticed to Dr. Jenks, of Boston, in 1851, and started in business on his own account ten or twelve years ago. He has been connected with the Massachusetts College of Pharmacy for about the same length of time and has served that institution for several years as an officer; at the time of his death he was vice-president. He was a member and officer of the Boston Druggists' Association and a member of the American Pharmaceutical Association. The deceased leaves a wife and two children; his mother and an older brother also survive him.